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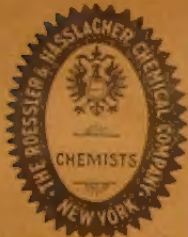
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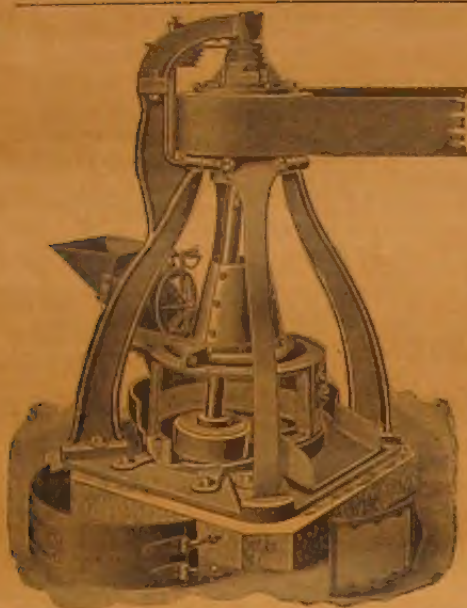
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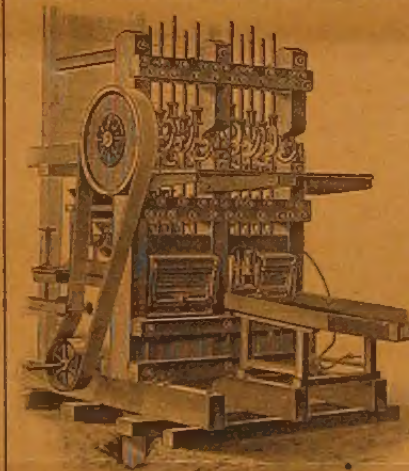
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The cost of constructing five of the great tunnels of the world was as follows: The Hoosac tunnel cost per foot \$379; Mont Cenis \$356; St. Gothard \$229; Albery \$154. The Northern Pacific tunnel through the Cascades was \$118 per foot. Three of the tunnels are in Europe and two in the United States. Their decreasing cost shows the progress made in blasting and excavating machinery.

EDITORIAL CORRESPONDENCE.

A Trip Through the Desert.

To those who have never been on the desert there is always a certain mystery connected with the point where the world stops and the desert begins, but after making a few trips well supplied for the journey all the terrible ideas of the deadly rattlesnake and the gaunt wolf who is supposed to be eating the bones of innumerable prospectors who have gone before disappears, and it is seen that life on the deserts (at least the California deserts) is not only bearable, but quite enjoyable.

We started from San Bernardino with one of Copley's best desert teams, and after a pleasant day's drive arrived in Banning, where there is a good hotel, The Banning. The distance from San Bernardino is about thirty miles. Leaving Banning early in the morning brought us by noon to Whitewater, which is really the edge of the desert. Just after leaving Whitewater we pass a mountain stream, which has ample water to furnish any amount of power, but at present all the water is running to waste. An easy afternoon drive takes us to Chuck Warren's ranch, where a good meal and a hearty welcome are always to be found.

After leaving Warren's ranch the road is quite an up grade to the top of the divide (seven miles) and from there to Warren's well (five miles) it is down hill. Six miles from the well the roads fork, one going to 29 Palms and the other to the Desert Queen mine and mill. We arrived at the mill the evening of the third day out. Mr. H. C. Steele, formerly of Perris, Cal., is now in charge. The five stamps are kept steadily running on ore from the Desert Queen mine, and results seem to be favorable. We found Mr. C. A. Farnsworth at the mill in the capacity of amalgamator. Leaving the mill the next morning, we arrived at the famous Desert Queen mine, better known as the McHaney mine. The mine is under the charge of Mr. O. T. McMillan, a thoroughly posted man. The vein on the mine is being worked by two incline shafts, which might be called tunnels, as the vein is very flat. A tunnel is being run from the side of the hill, which will be 55 ft. under the apex when finished. The idea is to prospect for the vein beyond any of the present workings on top of the mountain. A great deal of ore that was thrown aside when the mine was in bonanza is now being worked at the mill. Two six-horse teams keep the mill in ore for steady running. Messrs. Hodtson & Fannery own the south extension of the Queen. They have three claims, and on the one next to the Queen have a tunnel seventy feet long, and if the vein runs through these gentlemen have a piece of property that will be very valuable. At the time the McHaney mine was found every prospector had an extension, but we failed to see any other true extension except that held by Messrs. Hodtson & Fannery.

About one mile east of the Desert Queen Messrs. McMillan, Forrest & Keeler have located a lode called the Eagle Cliff. They have run three incline shafts which all show the vein, which is very strong for a long way on the surface, and can plainly be seen on the side of the mountain from a distance. They have what promises to be a valuable piece of property.

Recently five tons of Eagle Cliff ore were worked at the Lost Horse mill and returned \$130 per ton. About two miles from the Desert Queen Messrs. Martin and Hayes are

opening up a claim which is said to be very promising.

We left the Desert Queen, where we spent the night, and after traveling six miles to the south, arrived at the Lost Horse mill, the property of Messrs. Ryan & Kelsey. The camp is an ideal one, as far as comfort and convenience are concerned. A good supply of water is obtained for the present capacity of the mill, and a much larger supply can be obtained at any time by further developing the water.

The Lost Horse mine is five miles south-east of the mill over a good road, and present developments would prove it to be one of the best properties in Southern California for the amount of work done. The main shaft is now down about 220 feet, with a vein of ore that averages from three to seven feet in width from the top of the shaft down. There are two drifts at the one hundred foot level, and two drifts are being run further up the hill from the main shaft, one at the bottom of a fifty-foot shaft. This mine produced some very rich ore on top. We were shown a cut not over forty feet long and thirty feet deep, from which \$16,000 were taken by Mr. John Lang, one of the former owners. The present owners have a spring five miles from the mill which flows one inch of water, and it is proposed to pipe the water to the mine in case water is not found by going deeper. The Lost Horse mine is worked in a businesslike way, and there is no doubt but that it will be a good dividend payer.

South-east of the Lost Horse mine one mile, the Messrs. Burns Bros. are developing some properties. The Pioneer mine has a shaft and drift, the Imperial a 50-foot shaft and the Eureka a 30-foot shaft; the Occidental, another prospect, has no work done at present.

The Golden Treasure, belonging to Messrs. Hansen & Duggan, has a 25-foot shaft and some tunneling. The vein is about one foot wide and runs well in gold.

The Anaconda and Short-cut are two prospects owned by Kelsey & Swart. Each claim has a shaft which shows the vein two feet wide.

One of the most recent discoveries in the camp is the Golden Summit, owned by Messrs. Ryan & Swart. It is only one-half mile from the mill, and the samples taken have shown so well that they calculate within a short time to tram the ore down to the road near the mill.

The mines of Messrs. Tingman & Holland are located eight miles south-east of the Lost Horse mill. They have a good well of water and a two-stamp mill, at which all the ore from the country around was formerly milled.

The Pinon group of mines belonging to these gentlemen is one-and-a-half miles up the canon from the mill. The main mines in the group are the Nos. 1, 2, 3, 4, and the Alpha, Beta, Gamma, Delta, Epsilon, Zeta, Eta, Theta, Iota.

The group has been developed by a series of drifts, shafts and tunnels, and it is proposed, when proper arrangements have been made, to run a long tunnel under the hill which will cut a number of veins, and deliver the ore where it can be easily handled.

Six miles east of the mill is located the famous Hexahedron mine, belonging to Messrs. Tingman & Holland. This deposit of ore has been pronounced by all who have seen it to be one of the largest on the desert. The formation is very strange, and to a casual observer, the ore looks valueless. The vein is felsite. In one place we measured sixty feet all vein. A tunnel has been run in one

hundred and fifty feet. The vein has been cross cut, and shows stronger than on the surface. An average sample taken from the whole vein is said to have assayed \$12.50 in gold. The occurrence of gold in this formation is especially strange in the district where all the values were always found in quartz.

Mr. Ed. Holland lives in the canon where the mill is located, and is well known and highly respected in all the district, of which he is recorder.

In front of Tingman & Holland's camp in the Hexahedron mountain, Mr. D. M. Francis is working a group of mines, known as the Foot Hill, Queen, 49, and Hillside. He has some good looking lodes, and is steadily developing his claims.

Between the Desert Queen mill and the Lost Horse mill, Mr. Rooney is working on a property, and now has ore at the Tingman & Holland mill to be worked.

Leaving the Tingman & Holland mill, and traveling north-east, John Lang's camp is next reached. He is on the edge of the desert, which is crossed to reach Cottonwood.

Mr. Lang has two properties he is working on, one, the Thomas Gillhooly, and the other, the John Lang. Mr. Lang showed us the richest ore we have seen on the desert. He has a shaft down about forty feet, and is taking out very rich ore.

Leaving Lang's camp, and traveling towards 29 Palms, the road is very heavy sand for about seven miles, and very slow progress is made. We arrived in 29 Palms about 1 P. M., and found the camp full of travelers en route for Virginia Dale and other points. The water is about two miles from the mountains, and right in the desert, an abundant supply of water can be obtained here by digging a few feet.

In and around 29 Palms, many locations have been made, and the point is a good one to prospect as very low grade ore can be worked with an abundance of water and mesquite wood within three miles.

The Golden Chariot, five and one-half miles south-west of 29 Palms, has a 50-foot shaft and other development. This property belongs to Mr. J. W. Park, who has lived for some years around 29 Palms.

The Hamshire and North Star, located in the small hills, seven miles to the north of 29 Palms, have both been opened up. The Hamshire has two shafts, one fifty feet and the other 15, with some drifts. The North Star has a 50-foot shaft, with a tunnel the same length.

The Big Luck, in the same range of mountains, belongs to Mr. J. W. Wilson, the pioneer miner of the Palms district. Mr. Wilson has worked some of this ore in his arastra, at 29 Palms, and it paid well.

Messrs. Kinney & Snyder have some locations in the Black Hills, to the north of 29 Palms.

In Gold Park, 9 miles south east of 29 Palms, a great deal of work has been done in the last five years on the Santa Domingo, the property of Judge Morrison and others. A shaft has been sunk 126 feet deep. The Alta California, in Gold Park, also belongs to Judge Morrison and associates. The North Star, in the same district, has an open cut 300 feet long. Five miles south of 29 Palms is located the Summit Queen. On this mine there are two shafts, one 68 feet deep and one 40. Mr. J. W. Park, the owner, has taken out over \$3000 from this property in his arastra at 29 Palms.

The Rosa, belonging to Messrs. Bixler, Park & Thomas, is located $4\frac{1}{4}$ miles south-

west of 29 Palms on Palm Mountain; it has some development.

On the road from 29 Palms to Bagdad, and about 16 miles from the Palms, Messrs. Baldridge, Flood, Kinney & Snyder have the Gold Cove, on which they have done a great deal of work.

Three miles south-west of 29 Palms, Mr. J. M. Thurston has located some ground which has very favorable indications on top. Mr. Thurston has had the vein stripped in various places, and the croppings are very strong on both sides of his discovery point.

The Mountain Peak, about eight miles southwest of 29 Palms, is a very large blow-out of quartz. Mr. Thurston has located this property and done some work on it.

The Mountain Queen, also the property of Mr. Thurston, three and one half miles south-east of 29 Palms is one of the best-looking lodes on top that we saw around 29 Palms. All the country rock is syenite, and the vein has for a hanging wall a granite dyke about thirty feet wide, which cuts through the syenite. The vein has been uncovered at various points along the dyke. There is a shaft on the property thirty feet deep, and the vein will average at least three feet wide. Mr. Wm. Neaves has an extension to the Mountain Queen, and has developed his property enough to show a good body of ore. There were several other properties around 29 Palms, but as we could not find the owners nor obtain any information regarding them, we were obliged to pass over them. 29 Palms certainly has many advantages on account of the large supply of water so near.

On leaving 29 Palms to go to Virginia Dale, which is only twenty miles, it is a good idea to take plenty of water for the horses, as the road is sandy all the way, and they need it badly before getting to Lyons' well.

At Lyons' well there is a one-stamp mill. The well is said to afford plenty of water. The first property we visited in the Virginia Dale District was the Hoosier Boy, about one-fourth mile southwest of the Virginia Dale mine. Messrs. Ashabraner & Plant, the owners, were working on the mine when we arrived. They have a shaft 35 feet deep, and have taken out some rich ore. The Dead Horse mine runs parallel to the Hoosier Boy, and 900 feet west. It has one shaft thirty feet deep.

The Bonanza, one-half mile north of the Hoosier Boy, has a shaft about twenty feet deep. The Virginia Dale mine, from which the district takes its name, is owned by Messrs. Judson, Warner & Phelps. The main working shaft is 120 feet deep, with forty-foot drifts at forty-foot level, twenty-foot drifts at sixty-foot level, and other drifts at the 100-foot level. The ore has been stoped out to the surface from the forty-foot level. There is one shaft forty feet north of the main shaft, and there are various other workings on the property. The company also have a five-stamp mill about three miles from the mines. The Virginia Dale mine is said by all who have examined it to be a property that with proper management would pay well. We understood the owners were on the road at the time we visited the mine, and intended to start work on the mine and mill.

The Rattler, a north extension of the Virginia Dale, has two short tunnels, one under the other; one shaft fifty feet deep with two drifts, one twenty-five feet and one thirty feet at the bottom of the shaft. There is another fifty feet deep, and another tunnel about thirty feet long.

The M. T. Lang, an extension of the Rat-

tler on the north, has one shaft which at present is caved in.

The south extension of the Virginia Dale, the Good Hope, has three openings to show the vein. The S. S., between the Virginia Dale and Hoosier Boy mines, is owned by Messrs. Lyons, Ingersoll and Esley. They have an open cut and a shaft forty feet deep. The one stamp mill at Lyons' well belongs to these gentlemen.

The Ram's Horn, a north extension of the S. S., has three shafts. The owners are Messrs. Eard, Stewart and Greenleaf.

The Brooklyn, six hundred feet east of the Virginia Dale, has one shaft, and has turned out some very rich ore, some running as high as one dollar per pound.

The Little Bennie, a parallel lode to the Brooklyn, and six hundred feet above, east, has some development.

East of the Little Bennie, seven hundred feet, is located the Gold Block, which is opened up in several places. We moved our camp after the first day from the Virginia Dale mine to Burt's Well, in order to be more convenient to the properties located to the northeast. We were fortunate enough to meet Mr. Burt, who is one of the pioneers of the Virginia Dale country. He is one of the old school of miners who will go ten miles out of his way to show you a trail, and share his last piece of bread with you. Under the guidance of Mr. Burt, we finished our tour of inspection. The first property visited after our arrival at the well was that known as the Ellerman. This group of mines is located near the top of the mountains and about two miles from the well, part of the way by wagon road, and about one mile by a good mountain trail. We were very much surprised when we saw the amount of work that had been done in a district that is so little known and so seldom mentioned.

The Standard, the first mine on the Ellerman lode, has a tunnel which is now more than three hundred feet long. It is being run to catch the vein. There is also a shaft on this mine far above the tunnel which is 117 feet deep. We calculated that the pile of ore which is on the dump, and which was taken from this shaft, contained over one hundred tons.

The White Star, a south extension to the Standard, has a shaft one hundred feet deep, and a forty-five foot drift in bottom of shaft. The vein appears of an average of about two and one-half feet in width. At this shaft there was also neatly piled up a lot of ore of about one hundred and fifty tons.

The Ivanhoe, the next south extension to the White Star, has a sixty-five foot shaft and a vein about three feet wide. The pay streak, we were informed, assayed \$50. The Standard, White Star and Ivanhoe belong to Messrs. Ferguson, St. Germain, Gauthier and Ellerman. They are all workers, and have proved by what they have done that they thoroughly understand their business, and if they do not make a success it will not be on account of not being industrious and intelligent.

The last property visited on the Ellerman lode was the Tip Top, which belongs to Messrs. Botsford and Burt. This is the same vein as the other three. It has a shaft thirty-five feet deep, and the ore looks fully as good as any we saw in the camp.

The Halesworth property, which is about one and one-half miles from the Ellerman, was one of the surprises. The Carlyle mine is the main one of the group. The 760 foot tunnel starts on the Comet mine, which is the

north extension of the Carlyle. The tunnel was started with the idea of going in on the vein, but it was found that the vein was to one side, but it was reached, and the work continued on the hanging wall of the vein instead of on the vein, where the rock is much harder. Mr. Cooper, the foreman of the mine gave us some figures as to cost of tunneling that were remarkable. The hanging wall is soft talc, and good headway can be made. The tunnel is connected with a shaft 155 feet deep, which gives perfect ventilation. In one place, near the end of the tunnel, the vein has been cut, and it showed over fifteen feet of quartz. It was the largest vein we have seen in Southern California. A winze is being sunk in the tunnel, which is now over 70 feet deep. Five hundred feet south of the 155 foot shaft which connects with the tunnel is another shaft 92 feet deep. The Ruby is a south extension of the Carlyle, also the Belle, John A. Logan and Keystone.

We found at the Halesworth group Mr. T. J. C. Webster, who is our correspondent in the Virginia Dale district.

Mr. Cooper has charge of the work in the mine. After seeing most of the mines in Mexico and the south-west, we do not hesitate to say that if the Halesworth group does not prove a paying property, we have never seen any mines that would pay.

The Botsford lode is about 600 feet north-west of the Carlyle, and is supposed to join the Carlyle at the Golden Pass, which is 1500 feet north of the mouth of the long tunnel. The first location on the north end of Botsford lode is the Botsford. It has an open cut that exposes the vein and a tunnel 25 feet long.

The Big Prize next to the Botsford south, has a fifty foot shaft and a ten-foot drift in bottom of shaft that shows a vein of solid quartz, four feet wide, every piece of which will show gold in the horn.

The St. Paul, next to the Big Prize on the south, has a 40 foot shaft. The Mid Winter, next to the St. Paul, has several shafts, and shows a solid well defined vein.

Concerning the Botsford lode, we could not but think, while going down the trail and almost walking the whole way on the croppings to the point where the Carlyle lode meets it, that if some of the people who are buying land in Cripple Creek (some of which is a mile from anything resembling a mineral lode) would go to Virginia Dale, and run a tunnel from the lowest point in the gulch, and at the point of intersection follow both veins, they would within one year have a property that might not find a rival on the Pacific Coast. The veins are large on top, have grown larger with depth, and have sufficient value to leave a good margin, after deducting a reasonable sum for treatment, and if there is any reason why these properties should not be among the best in the west, we do not know what it is.

The Jean, located $1\frac{1}{4}$ miles east of Virginia Dale mine, is the property of Messrs. Killian & Sabathe, known in the camp as the "French boys." Mr. Killian is the Recorder for the district. These gentlemen have four shafts on the Jean, three 90 feet deep and one 22 feet, one drift 30 feet. The average width of their vein is three feet. The output from the mine is being milled at the "French boys'" mill, $7\frac{1}{2}$ miles from the mine.

The Supply, parallel to the Jean, and five hundred feet to the west, has one shaft 90 feet deep and several small drifts, also an 85 foot tunnel. The vein was very small on top and has varied from 1 to 7 feet in the shaft.

The San Bernardino, 9 miles south of the "French boys" mill, has a shaft 75 feet deep, and two drifts and a 50-foot tunnel. This property, as well as the Supply, belongs to Messrs. Killian & Sabathe.

The Schiller, Venus and Great Eastern, belonging to John McGrath, are located eight miles southeast of Virginia Dale mine. The Schiller has a one-hundred-foot shaft and numerous cuts. The Venus and Great Eastern are opened up at various points on the lode. As we were leaving for Los Angeles we were informed that Messrs. Stuart and Deberry were working on the Star, a location near the Gypsy, west of the Virginia Dale district.

Messrs. Lyons and Davis, we were also informed, were working on a prospect near the Gypsy. We have attempted to make this description as accurate as possible, but realize that we may have made some mistakes. If we have we will take pleasure in correcting them if the correct data is sent to us. We have undoubtedly omitted some properties, as our time was very limited, and in a country so sparsely settled it is impossible to find people. We hope to receive a description of anything we may have omitted, or a correction if mistakes have been made. It seems from our observation that the desert is the coming country for mines. It is quite reasonable to suppose that the hardest country to reach and operate in should be left until the last. All the desert country was passed over years ago, but then silver, copper and lead were more attractive to capital than low-grade gold mines, and there were many disadvantages about going to the desert then that do not exist now—the scarcity of water, high transportation, danger from Indians in Western Arizona, no process to work rebellious ores by, high price of labor and many other things not necessary to mention, all of which obstacles have been removed. The fall in the price of silver and lead has driven all the miners (and all the capital that yearly goes into mining) into gold mining, and as all the high-grade gold mines are held at such prices that only capitalists of large means can buy them, it naturally obliges those hunting mines to take hold of the low grade ones, and to seek on the desert for what they have been unable to find nearer the haunts of man. There is one matter we would most strongly recommend to the county of San Bernardino, and that is, the absolute necessity of good signs at the intersection of roads, and plainly stating where and in what condition the water is. It is hard to realize a more desperate position to be in than to be on the desert without water. We certainly hope this matter will be taken up by the supervisors of the county, as mining is becoming one of the most important industries in the county, and the hardy prospector who braves the desert should certainly have the privilege of knowing where the water is. That is certainly little enough for him to expect for the benefits that are derived from his discoveries. We expect in our next issue to publish a list of all the points on the desert where water is found. Our trip was very pleasant in every way, and we were extended every courtesy by the miners we met, and we feel that it is only a matter of a short time until the desert will be teeming with life, and the wide expanses of sand that are crossed with so much inconvenience now, will have the iron horse passing through them, and all the wealth that is locked up in the mountains will be brought out to benefit the condition of mankind.

W. P. Wilson, E. M., has gone to Chihuahua, Mex.

CORRESPONDENCE

ARIZONA.

Dato Creek Mountains.

PHOENIX, ARIZONA, April 20, '96.

The Tooker group of mines consist of three locations: the Golden Wave, first extension west of the Ethel. The last is a vein and mill site, furnishing an abundance of water for mill purposes, etc.

The mines are situated about one mile north-west of the Congress mine.

The Golden Wave was first located by Dennis May, the man who originally located and sold the bonanza to "Diamond Joe."

The development work shows a shaft sunk to a depth of 150 feet, a drift 50 feet long, which runs east from the shaft, 80 feet from the surface, and 200 feet of other developments, consisting of holes and tunnels on the first extension and other parts of the Golden Wave.

The mine was worked by Dennis May, 14 years ago, and about 200 tons of ore taken out and hauled to the foot of the mountain to the mill site now owned by Tooker, there he had erected a steam arastra in which the ore was worked.

The ore yielded by amalgamation only ten dollars a ton, which at that time would not pay. One year ago the arastra tailings were washed over blankets, which process caught much of the mineral in the nap of the same. The concentrates thus made were shipped to Prescott, treated by Mr. Wm. Gregor, and sold at the sampling works at that place.

That which was washed from the blankets in the upper sluice boxes being taken for first class, the lower for second class. The first class ran 10 ounces gold, the second $4\frac{1}{2}$ ounces. The tailings were then taken up from the end of the sluices and sold at the Cyanide works of the Congress Gold Co. They carried \$20 per ton.

There is two feet of ore in the bottom of the shaft. The drift that runs east from the shaft is in ore its entire length, and the ore that has been taken out is still on the dump. Several tons of the first class have been sorted, which carries from 5 to 6 ounces of gold per ton. The ore carries no silver and averages about \$45.

The vein is on the foot wall of a diorite dyke, that cuts the stratification of the country rock in various degrees from the right angle and is a coarse-grained granite with large quartzitic granulations.

The Congress mine is precisely similar to the Golden Wave in geological characteristics and the quantity of the ores.

P. J. CLARK.

Articles of incorporation of the Grand Canyon Mining Co. have been filed in Prescott, Arizona. The principal office of the company will be in Prescott, the capital stock is \$500,000, divided into five hundred thousand shares of \$1.00 each. The following gentlemen constitute the Board of Directors for the first year: P. D. Barnhart, President and General Manager; Eli Hiety, Vice President; A. D. Barnhart, Secretary and Treasurer; G. H. Richardson and J. O. Richardson.

The deepest gold mine in the world is at Eureka, California; depth, 2,290 feet. The deepest silver mine is at Virginia City, Nevada; depth, 3,300 feet.

Miscellaneous Mining News.

ARIZONA.

The report that was current lately in reference to an interest in the Waters mine in the Santa Maria mining district having been sold by Chauncey D. Clark, the proprietor, to Peoria, Ills., people is a mistake. We are informed that the only change to be made in that property is an increase of twenty more stamps, which will make the milling capacity forty stamps, the same that is being run at the Congress mine.

R. C. Houston has purchased the old Tip Top quartz mill and will erect it on the Agua Fria, where he has contracted to crush 2,000 tons of ore.

J. W. Yokum has employed P. H. Cayle to haul his 10-stamp mill to Humbug. It weighs 115 tons. As large quantities of ore are already on the dump at some of the mines in that section, the mill will be kept busy. One mine alone has ore valued at a quarter of a million dollars ready to haul to the mill.

The steamer Gila arrived in Yuma last week from Ehrenburg. The two barges, laden with the 10-stamp mill from La Paz mine were expected April 23rd.

The mining exchange in Phoenix is now an assured fact. A gentleman from Phoenix, who is now in Los Angeles, was recently interviewed by a representative of THE MINING AND METALLURGICAL JOURNAL of Los Angeles, and we are informed that a sufficient number of reliable men have been guaranteed to start the exchange on a sound footing.

(Mohave County Miner.)

The affairs of the Flores Mining Company will be settled up in a few days and that rich property will once more commence shipping bullion.

A French syndicate is about to take hold of the Temple Bar placer mines and will put in an immense hydraulic plant to work them. Engineers are now working on designs for the plant.

It is reported that Harshberger & Gill took a three-ounce nugget of gold from their dry diggings in the Chemebuevis mountains the other day. It was probably a retort the boys were working off as a nugget.

John Barry is shipping daily large quantities of rich ore and concentrates to the Denver ore market. The ore is produced by the Minnesota mine. The rich ore is assorted and the low grade crushed and concentrated before shipping.

O. D. Clack has taken charge of the Cerbat mine for a new mining company recently organized by O. B. Whitney. It is said that Mr. Whitney will be in Kingman in a very short time to pay off the indebtedness of the old company and start up work on the mine and mill. We hope so.

C. W. Tozer, the San Francisco mining man, who has been examining property in this county, has gone to the Grand Canyon, north of Flagstaff, to examine a copper mine. He will return to Mohave county in about two weeks, and will probably make some purchases for San Francisco parties.

Thomas MacMahon and William Larkin have had six tons of Nighthawk ore worked

at the Arizona Sampling Works this week, from which they realized several thousand dollars. The Nighthawk is a great property and only requires working to become the greatest gold and silver producer in Arizona.

Will and Greely Clack are preparing to open up the north extension of the Nighthawk mine. They have a crosscut tunnel that will cut the ledge at a depth of nearly one hundred feet, within thirty feet of the ledge. This they will run in and drift south under the mountain. The ledge on the surface shows up well in gold, and it is hoped that a large body will be encountered below water level.

A. L. McKesson has opened up one of the richest and most magnificent bodies of ore that White Hills has ever seen. It is in a new location, about one mile north of the Chief of the Hills. The ledge is a large one, and the ore of a character similar to that found in the G. A. R. Mr. McKesson brought in a small lot this week as a sample, and when he goes home he intends to timber up the shaft and sink it to a depth of one hundred feet.

About sixty miles north of Ehrenburg, the new find is reported to be turning out well. A tunnel is being run on the ledge, which is over four feet wide and which assays well in gold and copper.

J. P. Levy came down from McCloud's Camp, April 18, in a boat. He reports three men sinking a shaft on these claims, and they are now down fifty feet. The outlook is very encouraging, as there is an abundance of good ore in sight. Mr. Levy also inspected the Senator mine, the property of John C. Beatty, and he considers it a great property. He will leave in a day or two for the Harqua Halas, and after doing some prospecting there will return to Norton to do some work on one of his claims.—*Yuma Advertiser*.

PEARCE DISTRICT.

Those Who are Working in this Coming Section.

Since the discovery of the famous Pearce mine, and later the opening up of the Johnson-Fitts claims on Tomlinson Hill, interest has been centered and all eyes turned toward the new camp that has sprung up here, thus a recount of the numerous prospects on Tomlinson hill and vicinity will not be amiss.

Outside of the big bonanza, whose progress is receiving attention almost daily through the columns of the *Prospector*, and which continues a marvel to all mining men, the Johnson-Fitts claims rank next. A full account of an interview with owners and the work done was given to our readers April 23rd.

Sam Watt and Ed Tarbell, who have an adjoining claim to the Johnson-Fitts mine, are industriously sinking with excellent indications. They do not expect to tap the deposit of ore for which they are headed short of fifty feet, and are pushing forward with vim and muscle. Their camp is established near by, and such indefatigable energy as is displayed by them should be rewarded with success.

August Zeller and partner have a well-defined ledge recently struck on their property, which is five feet in width. The ore is of fair grade, and the encouraging sign of better looking ore as depth is attained gives an incentive to renewed efforts. The shaft is down about twenty-five feet, and quite a dump in-

creases daily as a monument to their labor. J. N. McDonough and Chas. Goetjens are interested in this group.—*Prospector*.

J. J. Fisher, United States deputy surveyor, is now at work on the March, Conglomerate, Iron Carbonates and Bitter Creek claims, the property of G. W. Hull.

The new reveratory, for the United Verde Copper Co., at Jerome, is about finished.

The Hillside Mine.

John Lawler came in from his Hillside mine, April 18th. Mr. Lawler and his partner, Mr. E. W. Wells, have built an excellent wagon road from Hillside station, on the railroad to the Hillside mine. The five-stamp mill at the mine is running steadily. About twelve tons of ore is run through daily; on an average this amount makes three tons of concentrates, but most of the values is in the concentrates. Some high grade ore is also shipped. Several freight teams are steadily employed hauling ore and concentrates to the station and supplies to the mine. Mr. Lawler reports cattle on the range as being in good condition, but that rain is badly needed.—*Prescott Courier*.

The great tunnel on the Hamilton-Poland-Bell mines, Big Bug district, is now in over 1550 feet. This tunnel, together with other workings, shows a continuous ore body for 2000 feet. The ore is high grade, averaging \$65 per ton, silver and lead predominating; the average width of the pay streak is twenty inches. When this tunnel and other work laid out shall have been completed, the mines will have been most systematically developed. Henry Murphy, a practical mining man, is superintendent.

At the Harqua Hala mines, the new find is developing into something good. The diamond drill has demonstrated that good ore exists at a depth.

A shaft has just been finished at the Dorsey mine, on the Colorado river. Mr. Joe Werninger is the contractor.

The Elkhart mine, in the Kingman country, has been sold to a Scotch syndicate, represented by Thomas B. Comstock, the price is said to be \$25,000.

Active prospecting is being done in the vicinity of the great La Fortuna mine, by Messrs. Gunn, Blume, Dietz & Jenkins.

Kingman Sampling Works.

The following is the weekly report of the Kingman sampling works:

Wm. Flanigan & Co., one-half ton Norma.
Flanigan & Co., one and one-quarter tons Norma.

Morgan Jones, one lot O'Fallon.
A. L. McKesson, one and one-half tons.
Andy Hance, one-half ton Schaefer's Treasure.
P. W. Harrington, one lot Prince Albert.
Shipped one carload to Pueblo.

Arizona Sampling Works.

The following lots of ore were worked at the Sampler last week:

W. W. Clack, eight tons Nighthawk.
D. Southwick, ten tons Star Spangled Banner.
A. N. Eaton, one lot White Hills.
McMahon & Larkin, ten tons Nighthawk.

Leased a Mine.

Dr. Dutcher has leased his McLellan mine in Lynx creek district to Messrs. Beahn, Roache & Kleinsmith. By a direct line, this claim is about five miles from Prescott. The deepest workings are 54 feet; the pay streak is from 6 to 21 inches wide, and the average value is \$200 per ton in gold and silver. The ore is galena in character, and in the deepest workings some native silver has been struck. The lessees will at once begin sinking and drifting on the vein. They have an excellent showing for lots of high grade ore, while it seems nearly certain that the doctor has a bonanza.

The United Globe mines have a force of men employed putting up their new sawmill at the old toll gate site on the Pioneer road. It will be complete in ten days. The contract for running the sawmill and furnishing mine timbers has been awarded to the Old Dominion Commercial Company.

CALIFORNIA.

SAN DIEGO COUNTY.

Picacho Mining District.

Ex-Senator Dorsey, S. B. Morgan and Hon. J. H. Carpenter returned from the Picacho mines April 23d. The *Yuma Sun* is informed that, as a result of the recent trip to Los Angeles, satisfactory arrangements were made for the purchase of the interests of Allen J. Smith and Mendivel in the twenty-eight claims, representing the claims ex-Senator Dorsey and associates have been interested in at the Picacho district. The first payment has been made and nothing now remains to prevent them going on with the work. We understand on good authority that it is their intention to keep a small force at work on development this summer and that this fall a 200-stamp mill will be erected on the premises. In the meantime, they expect to get the mines patented.

The *Sun* reporter has visited this group of mines and does not hesitate to say that in his judgment this is the biggest mining property in the Southwest. Senator Dorsey is making arrangements for beginning active operations this fall.

LOWER CALIFORNIA.

The Piramide mining people have their machinery on the way to the mines in Lower California.

MEXICO.

Denouncements.

By Jesus Solis and Miguel Rascon, the property adjacent to La Cruz and California mines, situated in the municipality of Morris, district of Ocampo.

By Henry Peterson, eight claims, bearing gold and silver, named Virginia, located in the district of Ocampo.

By Francisco Siqueiros, the adjacent properties between the Mariposa and San Amado mines, named Nuevo San Salvador, located in the district of Ocampo, also one claim named Guadalupe of Santa Juliana, situated in the mountain of Santa Ana in the district of Ocampo.

By Procopio Olea, six claims, gold and silver, named La Humildad, next to San Amado and Mariposa mines of Francisco Siqueiros, located in the mountain of Santa Ana in the district of Ocampo. Also by same party five

claims, gold and silver, named La Cruz, located in the Santa Ana mountains in the northern part of the district of Ocampo.

By George Look, James Taylor, Samuel Dedrik and Jesus Maria Casavantes, six claims, bearing silver, lead and copper, named Guaynopita, situated west of the mines Estrella del Norte in the district of Guerrero.

By Albion E. Shepherd, the adjacent properties of the Ruiz and Pina mines, in the Tesoripa mountains in the Yepachic section of Guerrero district. Also by same party fifteen claims, named El Capitan, northwest of the El Conde mines of Messrs. Browing and Prescott, in the Tesoripa mountains, Yepachic section, district of Guerrero.

By Jorge W. Mendez and partners, eight claims, named El Progreso, in the Pajarito mountains, Camargo district.—*Chihuahua Enterprise*.

NEW MEXICO.

[The Optic.]

No one can gainsay that there is a feeling of confidence in Las Vegas in the future prosperity of the Hematite mining district, which is located in the northern part of the Territory. Many look upon it as the coming Cripple Creek of New Mexico. So far as *The Optic* knows, there has not been a single man who has visited this camp who has returned with an unfavorable report, or, in fact, who has not returned with very flattering reports. Some of those who are in a position to learn which way the straws are blowing, claim that in the next four months more than 2000 people will locate in the Hematite district. The title to the land, up there, is undisputed and the Maxwell Land Grant company is exceedingly liberal in their terms with locators, even making better terms than can be made with the government.

The Optic has arranged for a regular weekly correspondence from the Hematite district, and will furnish its readers with the plain, unexaggerated truth.

The faith of the Surprise mine owners grows stronger with each passing day.

The coal mine out near Trout Springs is showing up better and better as the work of development proceeds.

Statehood means foreign capital to develop New Mexico's mines, and this capital will not be unwisely placed, either.

A regular camp has been established out near Mineral Hill, this county, composed largely of men who have crossed the main range from Santa Fe.

The Las Vegas Mining and Prospecting Company expect to have a report on their recent mill run, made from their Lake Valley mines, recently.

There is always a calm just before a storm, and the lull in business, now, may be the forerunner of better times. The mining interests will yet prove to be the salvation of New Mexico.

The owners of the Last Chance mine in the Mogollons, New Mexico, have refused an offer of \$50,000 for the property from Eastern capitalists.

D. C. Winters has some fine samples of sulphur, alum, asphaltum and onyx, all of which came from different places in San Mi-

guel county. A number of inquiries have been received by him from Chicago, in answer to an advertisement he had inserted in the newspapers.

Don Lorenzo Lopez is down about eighty feet in the old Spanish mine, in the vicinity of Anton Chico, and the "finds" are very interesting, though nothing valuable has been reported yet. There is every reason to believe, however, that this will prove a valuable property.

Lincoln county is beginning to claim recognition as a big gold producer. Very rich placer ground has recently been discovered in the Jicarrilla mountains. The gravel ground is over five miles square, and is being operated with dry washers; there is plenty of good timber but water is scarce.

The Missouri Belle, owned and now being developed by Carley & Sullivan, is showing up very well indeed. They have a well defined lead, about eighteen inches in width, the ore from which prospects well in gold. This is the claim from which a sample of ore was taken, at a depth of ten feet, which assayed \$3200 in gold. The vein pinched on sinking on it, but the owners, having faith in their prospect, kept going down, and it looks as if they were now about to receive their reward in a good lead of rich gold ore.—*Cerrillos Rustler*.

Water has been found in the Williams & Gonzales coal mine, near Cerrillos, at a depth of about fifty feet, and about 250 feet above the river bed. They are working now in a three-foot vein of first-class coal.

Reports come to White Oaks from the Jicarillas of a new strike of very rich gold ore on Soldier gulch, by "Scotty."

Another car of very rich ore from the Ortiz mine is being loaded at Cerrillos for Pueblo.

W. H. Skidmore, who leased the Bennett Stephenson mine about a month ago, has already shipped one car of first-class ore to Pueblo, Col., and has two more carloads on the dump ready for shipment.

Sixty-five men are working on the properties of the new company who recently bought the old Carlisle mine. The company have several other properties which are being rapidly developed, among them are the Imperial, McDonald and Summit group.

[Denning Headlight.]

CENTRAL.

The Texas and Grand Central mines are keeping up their reputation as producers. Many needed improvements are in progress. A large steam hoisting plant will take the place of the one formerly in use, and will furnish hoisting facilities to a depth of 500 feet. A general resume of operations upon these valuable properties will soon be given in these columns.

Rogers, Biddle and Harlee are working day and night shifts on the Roscoe mine at Hilltop, near Whitewater canon, on the Silver City & Northern railroad. The shaft is down nearly thirty feet and shows a 14-inch vein of rich ore, similar to that found in the Texas and Grand Central mines. This property gives promise of being a permanent producer.

HANOVER.

The Southwestern Coal and Iron company will commence shipping iron to El Paso next week.

The New Mexico and Arizona Smelting company of Ivanhoe blew in their smelter last week. The shortage of water at Pinos Altos has curtailed the supply of sulphuret ores, which were produced by concentration, and in consequence the smelter was compelled to suspend operations temporarily.

The New Mexico and Arizona Smelting company has fourteen men at work on the Guadalupe, Yosemite and Chimo copper mines at Santa Rita. The mines are owned by the Santa Rita Copper company, and are being worked under lease by the smelting company. All three of these mines are now producing fair quantities of good copper ore.

MOGOLLON.

It is asserted, by those in position to know, that all conflicting claims to the Little Fannie mine have been settled, and that this valuable property will soon be started again.

The Maud S. is running steadily on free milling ore from the Last Attempt and Maud S. mines. The prospects of the company are brighter than at any time within the past year. Dividends may soon be looked for.

The Confidence mine was started in on Wednesday morning, April 1st. The ore bins are all filled, and contain sufficient ore reserves to keep the mill running steadily during stormy weather, which might delay the ore teams. The mine is producing its regular quota of eighty tons per day.

One of the quickest moves ever made in the camp was the putting in place and starting the Deep Down stamp mill, which commenced crushing ore April 20th. The mill was purchased, shipped from Silver City, put up in place and crushing ore all within three weeks. This beats all previous records on milling machinery.

WHITE OAKS.

The Old Abe Co. have been running their twenty-stamp mill on ore from the dump, and with excellent results. The cave-in of the mine was a dire calamity for White Oaks, but the new departure indicates a brighter prospect for the future.

Other mines on Baxter mountain, the only mineral section of the White Oaks district, are idle and nothing is being done with them. Some parties are doing their assessments and developing their properties at the same time.

Strike at Golden.

The correspondent of the *Cerrillos Rustler* writes to that paper as follows:

The recent strike made on the C. & C., formerly the St. Elmo mining claim, within half a mile of San Pedro, is attracting considerable attention. The owners of the claim, Messrs. J. T. McLaughlin, Frank Wilmarth and Joe Stewart, in cross-cutting from the bottom of the fifty-foot shaft at the entrance to the main drift at a depth of seventy-five feet have struck a strong lead of iron and manganese ore. The lead is from ten to twelve feet in width. The ore runs well up in gold, one assay test giving a return of \$50 per ton.

There has not been an average test made as yet, but it will be done at once. The ore re-

sembles that found in the Lincoln-Lucky. The regular trend of the lead is east, dipping to the northeast, and from all appearances this ore body runs under the present body of the Lincoln-Lucky at a depth of several hundred feet. The C. & C. claim lies northwest of and adjoining the Lincoln-Lucky. This vein is a true fissure which has been traced for over 700 feet on the surface. At a depth of from twenty-five to thirty-five feet this fissure varies from three to eighteen inches in width, and a drift was run in at the depth named for a distance of 220 feet, showing some rich ore, but not in any great quantity.

The 50 foot shaft at the mouth of this drift was sunk on the small fissure. This shaft and the 220-foot drift was run all the way within four feet of this large body of ore which the cross cutting has shown up. It seems that they have only struck the edge of the lead as yet, and great things are expected when they get well into the vein. There is no telling how wide a lead or how large an ore body is likely to be opened up within a few feet more of development work.

It looks as if these fortunate owners of the C. & C. have struck the mother lode of that section.

(Enterprise.)

SILVER CITY.

The Silver City Smelting and Refining Company have been delayed in starting their plant by the tardiness of the manufacturers who have the contract for the new stack. The new furnace will be shipped from Chicago May 2nd. In the meantime many needed improvements are being made at the works. The auxiliary furnace has been moved and rebuilt, ready for operation when needed. It will be but a short time after the arrival of the new water-jacket till the works are in full blast.

FINOS ALTOS.

The shaft house on the Aztec mine was blown down by the high wind which prevailed Friday night. It is probable that the machinery will be moved to the tunnel level before work is resumed.

The Treasure Mining Company of Denver, Colo., are pushing development as rapidly as possible, under the management of J. H. Shockley. On Saturday the shaft attained a depth of 307 feet and sinking has been temporarily suspended while drifts are being run at the 500-foot level. Ore is being stoped from the 200-foot level and everything is being put in readiness to start the mill as soon as a few necessary small pieces of machinery arrive. The pipe which conveys water from the springs near Twin Sister Peaks to the mill has been repaired and over 1000 feet of new pipe used to replace the old worn material. Within two weeks the Atlantic mine will again be on the list of gold producers.

The Copper Flat Mining Company of Copper Flat, Grant county, are sinking several shafts on that property. One working shaft is now down 260 feet, and it is the intention of the company to extend it at least 500 feet, if water is not found above that level. The company also have in view the building of a smelter for treating copper ore.

Cerrillos has been greatly excited in the last week by the discovery of petroleum in the well of a Mr. Matthews living near the depot at that place. Work in the boring has been

in operation for some time, and the well is down 112 feet. The last 40 feet has been through solid slate. On Saturday last when the sand pump was used to clean out the boring, it brought up a considerable quantity of oil, which on examination proved to be petroleum. There is much excitement in the town and a company has been organized to develop the field, should the analysis prove the oil to be of sufficient commercial value. We hope that the oil will be all right, and that it will be found in sufficient quantity. It will encourage our own townspeople to persevere in the local oil field in that event.—*Gleaner, April 25th.*

IVANHOE.

The smelter is running regularly now, and is receiving an abundance of ore and concentrates. The output of matte is up to the usual average, and everything is going on swimmingly. The Pacific mill concentrates are being shipped there for treatment.

WHISKEY CREEK.

Harvey H. Whitehill's new find of lead ore has every indication of proving a bonanza. The shaft is now down sixteen feet, and shows up fourteen inches of heavy galena ore. Two men have been at work for the past week, and they have taken out some good ore, a considerable portion of which has been stolen. They have found some good copper silver ore in another place as well as some silver float which at a moderate estimate will run 10,000 or 12,000 ounces per ton. There is no need of going to Cripple Creek when such ore can be found much nearer home.

Taylor & Whitehill have completed the assessment work on their copper-silver-gold properties in the Potrillo hills. They have out several tons of high grade ore, and they expect to do considerable more work this summer.

GENERAL NEWS

PATENTS.

Messrs. Hazard & Townsend, solicitors of patents, room 9 Downey Block, Los Angeles, California, report the following recent patents of interest to mining men:

April 14. No. 558,460—Amalgamator—W. Robinson, Denver, Colorado. Assignor one-half to J. E. Greenwalt. A casing is provided with oppositely inclined series of perforated amalgamating plates having a screen above each plate and a rotary fan or dasher arranged between each series to agitate the material and cause it to pass through the screens and plates.

April 14th. No. 558,357—Electrical Furnace—M. R. Conley, Brooklyn, New York. Assignor to W. Bell, New York. An electrical furnace comprising a vessel of a composition containing carbon, integral arms of the same material on opposite parts of the vessel, and the terminals of an electric circuit connected with the arms.

April 14th. No. 558,850—Electric Mining Cage and Elevator—C. J. Cutler, Butte, Montana. Vertical guides are provided with toothed racks on opposite sides and the cage carries an electric motor having pinions working in the racks and operated by a trolley. Suitable safety devices are provided in case of breakage.

April 14. No. 558,190—Stamp Mill—W. A. Logue, Sunset, Montana. A revoluble cylinder, consisting of three rings having in-

ternal openings of different sizes, and stamp shoes arranged to grind on the inner faces of the rings.

April 21. No. 558,725—Process of producing Hydrous Chloride of Aluminum—Frank A. Gooch, New Haven, Conn., Assignor to the Waldo Foundry, Bridgeport, Conn. Aluminous material is treated with dilute hydrochloric acid, the solution treated with the undissolved residue by filtration. Gaseous hydrochloric acid is then introduced into the solution, and the precipitate separated therefrom.

No. 558,726—Process of producing Hydrous Chloride of Aluminum—F. A. Gooch, New Haven, Conn., Assignor to the Waldo Foundry, Bridgeport, Conn. Aluminous earth is heated together with sulphuric acid, then treated with dilute hydrochloric acid, separated by filtration, gaseous hydrochloric acid introduced into the solution, and the resultant precipitate separated therefrom.

April 21—No. 558,745—Method of treating Arsenical Ores—D. Sheedy, Denver, Colorado. The speiss is separated from the matte product of the furnace, crushed and spread over a bed of fume, the fume is ignited to drive off the arsenic and center the fume and valuable metallic constituents of this speiss.

April 21. No. 558,774—Counterbalance for Chutes of Ore Docks—R. O. Carter, Evanston, Ill. One end of the chain is attached to the chute, passes up over a windlass, thence down under a pulley, thence over another pulley, thence downward having counterbalancing weights secured at intervals along its pendant length, and its end fastened to the frame-work, so that as the chute is raised into a perpendicular position, the weights are one after another suspended by the framework instead of the chute.

April 21. Nos. 558,647 and 558,648—Two patents, both for Apparatus for Separating Matte from Slag—M. W. Iles, Denver, Colorado. Both patents consist in substance of a furnace provided with two outlets, one for the slag, and a lower one for the matte. The furnaces are movable so they may be tilted to draw all the matte from beneath the slag.

April 21. No. 558,674—Ore Mining and Separating Machine—M. Covel, Chicago, Ill. A series of mercury bath frames, each having a bath receptacle in one end and a screened opening in the other, such arrangement alternating throughout the series, suitable partitions and pivoted rockers for carrying the ore through the bath and over the screen through which the ore passes into the next succeeding mercury bath.

April 21. No. 558,915—Ore Concentrator—J. Wennen and C. Hart, Frisco, Utah, Assignors one third to J. H. Johns, same place. A circular rotary platform having a central opening is arranged to pass beneath a brush which reciprocates over the platform, radially, to assist the ore to discharge at the center, where a launder is arranged to receive the ore.

April 21. No. 558,803—H. Gregory, Jr., Boston, Mass.—Ore Crusher. A circular bed having inclined sides is provided with a series of wheels or rollers having inclined faces fitting the bed and carried therearound by a rotating shaft.

April 21. 558,622—Rock Boring Machine—Rudolph Meyer, Milheim-on-the-Ruhr, Germany. This comprises improvements in the arrangement of the inlet and exhaust passages of a percussive rock drill.

Copies of the above patents will be furnished by Hazard & Townsend for 25 cents each. (Stamps received.)

The Fulton Engine Works, Los Angeles, Cal., are building a jet condenser for the Los Angeles Electric Company to condense the steam from a 1300 horse-power compound engine. The design is similar to the one recently built for the same company for a 900 horse-power compound engine. The new condenser will weigh about 24,000 pounds when completed and is operated by a pair of compound engines directly connected to the air pump pistons, which are twenty-four inches in diameter. A large share of the air pump portion of the condenser is of composition which this company have special facilities for turning out. The heaviest single castings that is used in the construction of the condenser weighs about 11,000 pounds. For handling this extra heavy line of work the Fulton have a massive electric traveling crane capable of handling twenty tons, the motor on the crane being fifteen horse-power. The electric current is taken from the Los Angeles Electric Company's wires.

We have received the handsome catalogue of the Fulton Engineering and Shipbuilding Works of San Francisco, Cal. They have built a number of the large mills in the southwest, the last one being that of the Gold Cross Mining Co. at Hedges, San Diego county, Cal. This mill of 100 stamps has been pronounced by all who have seen it to be the most complete of the kind on the coast. It has been fully described in our columns. The Fulton Engineering and Shipbuilding Works have one of the largest works on the Coast, and are fully prepared to turn out good work promptly, and all contemplating the erection of mills will do well to correspond with them at 213 First street, San Francisco, Cal..

The well-known Hammond Manufacturing Co. of Portland, Oregon, are building a 20-stamp mill for one of the big mines in Southern Oregon. This mill is to be built in such a way that either steam or electricity can be used. A fine water power system has been put in, and will furnish power for the electric plant. The Hammond Manufacturing Co. have been building mills and dealing in mining machinery for years, and thoroughly understand the needs of the miners. They are prepared to furnish good machinery as cheap as it can be found in any part of the country. Their advertisement will be found on page 17.

At Johannesburg, South Africa, a mine staff usually consists of a general manager with a salary varying from \$6,000 to \$15,000 a year, and the following: Manager, \$200 to \$400 a month; underground manager, \$200 to \$350; cyanide manager, \$200 to \$300; chief engineer, \$200 to \$300; compound manager, \$150 to \$250; secretary, \$150 to \$250; surveyor, \$150 to \$200; assayer, \$125 to \$200; storekeeper, \$25 to \$150; timekeepers, \$100 to \$125; boarding houses charge \$35 per month.

Articles of incorporation of the Minnesota, Arizona Mining and Development Co. were filed with the County Recorder at Phoenix, Arizona, April 4th. The officers of the company are Hiram C. Truesdale, President and Treasurer; James W. Lawrence, Vice President, and Frank L. Conkey Secretary. The authorized capital stock is \$50,000, divided into 10,000 shares of \$5 each. The principal place of business will be Phoenix, Arizona.

The big test case between the Mercur Gold Mining and Milling Company and the Gold and Silver Extraction Company of America, limited, has been won by the Gold and Silver Extraction Company of America, limited. The Mercur Company have paid \$20,000 back royalties, and have taken out a license for their future use of the process under royalty. The Leadville Gold and Silver Extraction Company are now erecting a 50-ton cyanide plant in Leadville Colorado, to handle the low grade ores of the Leadville gold belt. A new plant is being erected in Arizona, to use the process, and the Metallic Extraction Company, at Cyanide, Fremont County, Colorado, are doubling their present 150-ton daily capacity. The business of the Gold and Silver Extraction Company is largely on the increase, and in many districts where mining has not been carried on for years, on account of ore being too low grade, the process is being tested, and before twelve months have passed, bullion will be turning out of localities which at present are producing nothing.

Articles of incorporation of the Prescott and Cleveland Mining and Milling Co. of Prescott, Arizona, were filed in Ohio April 11th. The principal office will be in Cleveland, Ohio. The authorized capital stock is \$1,000,000, divided into one million shares of \$1.00 each. The Board of Directors for the first year are Messrs. Frank Billings, W. H. Dodge, W. S. Chamberlain, A. R. Fleischmann and J. P. Perkins.

PERSONAL-NEWS ITEMS

Judge John N. Campbell of San Bernardino was one of the callers at the JOURNAL office this week.

Prof. W. H. Seamon of the School of Mines at Socorro, New Mexico, returned the middle of last month from Washington, where he has been to secure appropriations for the school.

John I. Ginn of El Paso, Texas, has been on a professional trip to Clifton, Arizona.

Mr. A. Bayer, the successful miner from the Dragon Mountains, Arizona, has gone to Bisbee, Ariz., on a visit.

A. J. Doran has returned to Goldfield, Arizona, after a short absence. He is the superintendent of the Bulldog mine there.

J. I. Riley, the mining man, arrived in Prescott, Arizona, April 20th.

Thomas Lewis of Hedges, Cal., has gone to the Fortuna mine, in Arizona.

Frank Agara, superintendent of the Dorsey mines on the Colorado river, was in Yuma, Arizona, last week.

Dr. J. W. Ford of Phoenix, Arizona, has just returned from a mining trip to Goldfields, Arizona.

Mr. S. Harris has arrived in Kingman after a six months' prospecting trip.

E. Thayer of Phoenix, Arizona, has gone on a trip to Parsons, Kansas.

Mr. H. B. Eldridge of the Bradley Pulverizer Co., of Boston, Mass., gave the JOURNAL office a pleasing call on the 17th ult. Mr. Eldridge was here in the interest of his company.

Harry E. Holland, one of the former owners in the Elevada mine at Banner, Cal., has gone on a prospecting trip to the desert.

A. P. Hume, of Chihuahua, Mexico, has gone to Batopilas, Mexico.

H. T. Rudisell of Los Angeles, California, has gone to the Altura mine in San Bernardino county, where he will fill the position of assayer.

Chas. Tyng of the El Oro mines, Mexico, is stopping in the City of Mexico, Mexico, for a short time.

Mr. Crandall of the Bon Tricker mine at Manvel, was a visitor in Los Angeles during La Fiesta.

E. N. Smith of Chicago is in Los Angeles looking for a good mining proposition in Southern California or the southwest.

C. Steubenrauch of the Boulder camp, was among the visitors in Los Angeles during Fiesta week.

F. H. Coffey, connected with the Boulder Mining Co. at Boulder, Riverside county, was a caller at the JOURNAL office April 27th.

W. H. Shaw of Ventura, Cal., who has just completed a course in assaying at Wade & Wade's office in Los Angeles, Cal., will leave for Prescott, Arizona, in a few weeks.

W. T. Smith, one of the prominent assayers of Los Angeles, has returned from New York City. He reports much interest taken in mining in New York.

H. W. Hardinge, E. M., returned from Denver, Colorado, last week.

M. L. Wade has returned from Riverside county and reports the outlook favorable in the districts he visited.

C. E. Reade, from the Desert Queen district, Riverside county, has gone to Winchester, Cal.

Judge Richard De Kuhn of Cherry Creek, Arizona, has been on a trip to Prescott.

S. D. Kempton, E. M., of the Vulture mine, Ariz., has been to Phoenix, Ariz., on a business trip. He reports his camp in a favorable condition.

John Rock, an old-timer from Tombstone, Arizona, received serious injuries in the McCabe mine near Prescott, Arizona, a short time ago.

John Foy, one of the old-timers in the Organ Mountains in Southern New Mexico, was in Las Cruces, N. M., last week and reports a very rich strike in San Augustine Peak, only eighteen miles from Las Cruces.

Messrs. Lewisohn & Hynes of the firm of Lewisohn Bros., New York City, were in Clifton, Arizona, last week.

A. H. Turner, of Oregon, and a placer miner, was one of the callers at the JOURNAL office, April 28th.

P. J. Clark, of Phoenix, Arizona, spent a week in Los Angeles during the Fiesta.

P. P. Bush, representing the Canton Steel Company, of Denver, Colorado, was a caller at the JOURNAL office, April 11th.

A. W. Davis, of the Viznaga Mining Company, of Lower California, was one of the callers at the JOURNAL office, April 27th.

Judge G. E. Otis, of the Altura Mine, San Bernardino County, was one of the callers at the JOURNAL office this week.

Wm. Guggenheim, one of the members of the big smelting, firm of Colorado and Mexico, was in the City of Mexico, April 25th.

W. P. Wright, of Chihuahua, Mexico, has gone to Guerrero, Mexico, on business.

S. S. Gates, of Mexico, has gone to Washington, D. C., on business.

J. M. Day, of the Golden Chariot Mine, in the Parris district, Cal., has returned from Mexico.

A. L. Villagran, of Guadalupe, Mexico, has gone to the City of Mexico, to meet Mr. J. R. Williams, and with whom he expects to visit the Pijito Mines, in the State of Jalisco, Mexico.

The following mining men visited Los Angeles in the last two weeks:

J. Goldtree, of Tucson, Arizona.
Mr. Kampheiser, of Glendora, Cal.
Ira L. Harmon, of San Jacinto, Cal.
H. B. Vercoe, Peris, Cal.
E. E. Banta, Riverside, Cal.
Pahl & Decker, San Pedro, Cal.
C. W. Holt, Death Valley, Cal.
W. H. Johnson, Prescott, Ariz.
C. W. Dersee, Lower California.
Chas. Bruzelius, Indio, Cal.
E. H. Pedley, San Jacinto, Cal.
S. Holland, San Gabriel Canon, Cal.
F. F. Frisbee, Cripple Creek.
Mr. Thomas Ryan, of Lost Horse Mine, Cal.
Mr. S. M. Kelsey, of Lost Horse Mine, Cal.
E. E. Chilson, Hemet, Cal.
Chas. Briggs, San Jacinto, Cal.
Frank Dunham, Bagdad, Cal.
Jas. B. Fleming, Phoenix, Ariz.
F. A. Wright, Prescott, Ariz.
J. Brichtold, Escondido, Cal.
J. Baker, San Jacinto, Cal.
Frank Cole, Death Valley, Cal.
A. D. Lloyd, Indio, Cal.
W. R. Ireland, Barstow, Cal.
F. K. Shawhan, San Bernardino, Cal.
E. A. Wetmore, E. M., from Detroit, Michigan, recently from Yuma, Arizona.

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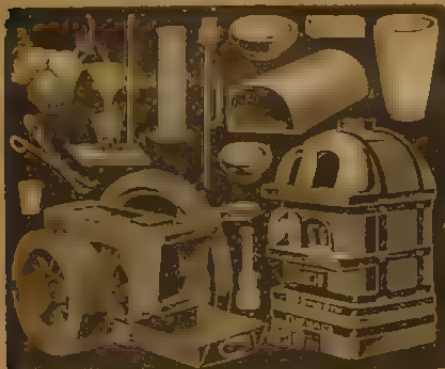
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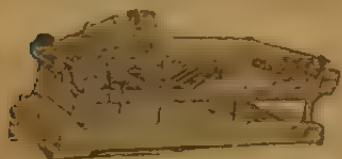
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Арт	СЛУЖ	КОРРЕ	ПАТ
16	02	10	8
17	01	11	03
18	01	11	00
19	02	01	00
21	02	03	00
22	01	03	00
25	01	01	00
26	01	11	00
30	01	10	00
31	00	11	00
32	00	11	00
39	12	11	00
40	12	10	00

BOSTON

Allouez	1 00	Franklin	15 00
Atlantic	18 00	Keatsarge	12 00
Boston & Mont'a	77 00	Keasola	26 00
Butte & Boston	23 00	Quincy	125 00
Cal. & Helca	305 00	Tamarack	114 00
Centennial	2 00	Wolverine	6 00

COLORADO SPRINGS STOCKS

Anaconda	59	Mollie Gibson	85
Blue Bell	05	Matoa	18
Colfax	05	Mount Ross	16
Columbine	83	Ophir	10
Fanny Rawlins	10	Orphan Bell	12
Gold King	53	Pharmacist	13
Gold and Globe	22	Summit	25
Isabella	52	Work	18
Jack Pot	08	World	02
Jefferson	18	Del Monte	03
Monarch	08		

DENVER STOCK REPORT

Alamo	08 ³ / ₂	Annaconda	59
Amity per M	1	Aola	06
Bankers	08	Big Six	03
Cement	15	Boston & Id	17
C & Con	07	Calfee	05
Chertaco	03	Gold & Globe	05
C & C C	06	Mollie Gibson	52
Golden Rule	1 57	Mt Rosa	18
Gold Standard	09	Pharmacist	16
Isabella	50	Union Gold	16

HELENA, MONTANA

Alice	25	Granite Mount' .	2 00
Bald Butte....	3 55	Hope	1 50
Benton Group.	10	Iron Mountain	45
Bl-Metallic	3 50	Ontario	1 00
Elizabeth	10	Peorinan	45

NEW YORK

Crown Point	35	Sierra Nevada	2
Con. Cal & Va.	2 10	Standard	2
Gould & Curry	40	Union Con	
Hale & Norcross.	1 25	Iron Silver	
Homestake	80 50	Quicksilver	3
Mexican.	50	Quicksilver pfd	17
Ontario	11 50	Bulwer	
Ophir	1 30	Yellow Jacket.	
Plymouth	20	Deadwood	

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Alta	12	Mono
Belcher	24	Nevada Queen
Best & Belcher	76	Ophir
Bodie Con	35	Potosi
Chollar	40	Savage ..
Con. Cal. & Va.	150	Sierra Nevada
Crown Point	35	Union Con
Hale & Norcross. 1	25	Utah
Mexican	45	Yellow Jacket
Gould & Curry	35	Bulwer

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American Nettle	25	Elizabeth	
Granite Mt.	2 00	Leo.	
Adams	80	Hope	1
Bi-metallic	3 30	Small Hope	

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Am. Bull	70	Horn Silver	2 30
Am. Nat. G's	70	Little Pittsburg	85
Anchor	3 25	Lucky Bull	25
Apex	07	Mammoth	2 15
Bopon	26	Meers	25
Bull, Beck	6 50	Meeruc	7 35
Cane Springs	60	Myer	2 30
Car. Curska	85 00	Niagara	25
Cleve. Con.	45	No. Boreka	25
Comstock	16	North Spy	80 00
Crecent	04	Ontario	12 00
Dalton	50	Silver King	14 25
Daly	6 50	Silver Spar	16
East. West	20	Star	16
Eden	20	Star	16

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Angustinas	Guantanamo	\$
Anturquina y Anexos	Ecatepecas	
Cerro Colorado	Chihuahua	
Concepcion y Anexos	S. Luis Potosi	
El Estero		
El Por		
La de H. de	Nuevo	
La de H. de	Hidalgo	
La de H. de		
Rosario y Anexos	Durango	
do prof.		
San Rafael del Oro	Guamato	
Sis. Grer. y Anexos	Hidalgo	
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Tierras de		
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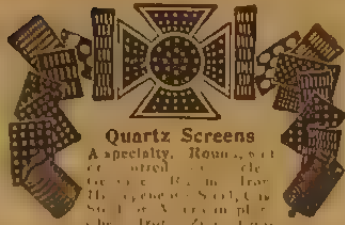
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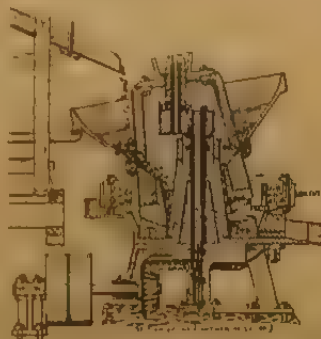
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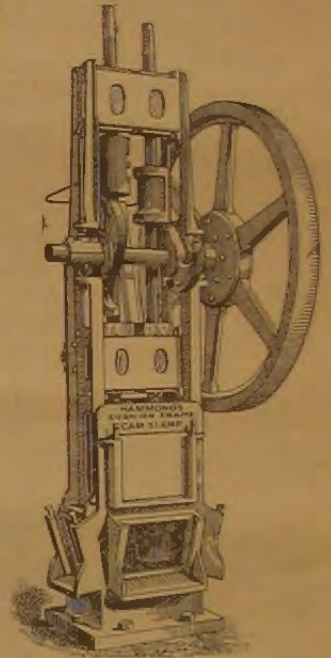
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	Kansas City	15.50	17.00	19.00	
Orizaba, " "	El Paso	9.50	11.00	13.00	
	Pueblo	12.50	14.00	16.00	
	Denver	14.00	15.50	17.50	
	Kansas City	14.50	16.00	18.00	
Tucson, " "	El Paso	9.00	10.50	12.50	
	Pueblo	11.50	13.00	15.00	
	Denver	13.00	14.50	16.50	
	Kansas City	13.50	15.00	17.00	
Hermosillo, " "	El Paso	8.50	10.00	12.00	
	Pueblo	10.00	11.50	13.50	
	Denver	11.50	13.00	15.00	
	Kansas City	12.00	13.50	15.50	
Paseo, " "	El Paso	8.00	9.50	11.50	
	Pueblo	10.00	11.50	13.50	
	Denver	11.50	13.00	15.00	
	Kansas City	12.00	13.50	15.50	
Querobabi, " "	El Paso	7.00	8.50	10.50	
	Pueblo	10.00	11.50	13.50	
	Denver	11.50	13.00	15.00	
	Kansas City	11.50	13.00	15.00	
Santa Ana, " "	El Paso	6.50	8.00	10.00	
	Pueblo	9.50	11.00	13.00	
	Denver	11.00	12.50	14.50	
	Kansas City	11.50	13.00	15.00	
Magdalena, " "	El Paso	6.00	7.50	9.50	
	Pueblo	9.00	10.50	12.50	
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	Kansas City	11.00	12.50	14.50	
Imuris, " "	El Paso	5.50	7.00	9.00	
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Nogales, A. T.	El Paso	5.00	6.50	8.50	
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Calabasas, " "	El Paso	4.50	6.00	8.00	
	Pueblo	7.50	9.00	11.00	
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Sanford, " "	El Paso	4.00	5.50	7.50	
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Crittenden, " "	El Paso	3.50	5.00	7.00	
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Fairbank, " "	El Paso	3.00	4.50	6.50	
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	Denver	7.50	9.00	11.00	
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Falcon, " "	El Paso	2.50	4.00	6.00	
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Benson, " "	El Paso	2.00	3.50	5.50	
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	Denver	6.50	8.00	10.00	
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Steins Pass, N. M.	El Paso	1.50	3.00	5.00	
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Lordsburg, " "	El Paso	1.00	2.50	4.50	
	Pueblo	4.00	5.50	7.50	
	Denver	5.50	7.00	9.00	
	Kansas City	6.00	7.50	9.50	
Silver City, " "	El Paso	0.50	2.00	4.00	
	Pueblo	3.50	5.00	7.00	
	Denver	5.00	6.50	8.50	
	Kansas City	5.50	7.00	9.00	
Hudson, " "	El Paso	0.00	1.50	3.50	
	Pueblo	3.00	4.50	6.50	
	Denver	4.50	6.00	8.00	
	Kansas City	5.00	6.50	8.50	
Deming, " "	El Paso	0.00	1.00	3.00	
	Pueblo	2.50	4.00	6.00	
	Denver	4.00	5.50	7.50	
	Kansas City	4.50	6.00	8.00	
Florida and Lake Valley, " "	El Paso	0.00	0.50	2.50	
	Pueblo	2.00	3.50	5.50	
	Denver	3.50	5.00	7.00	
	Kansas City	4.00	5.50	7.50	
Nott, " "	El Paso	0.00	0.00	2.00	
	Pueblo	1.50	3.00	5.00	
	Denver	3.00	4.50	6.50	
	Kansas City	3.50	5.00	7.00	
El Paso, " "	El Paso	0.00	0.00	1.50	
	Pueblo	1.00	2.50	4.50	
	Denver	2.50	4.00	6.00	
	Kansas City	3.00	4.50	6.50	
Las Cruces, " "	El Paso	0.00	0.00	1.00	
	Pueblo	0.50	2.00	4.00	
	Denver	2.00	3.50	5.50	
	Kansas City	2.50	4.00	6.00	
Rincon, " "	El Paso	0.00	0.00	0.50	
	Pueblo	0.00	1.50	3.50	
	Denver	1.50	3.00	5.00	
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Engle, N. M.	El Paso	2.20	2.60	3.60	5.00
	Pueblo	5.50	7.00	9.00	10.20
	Denver	7.00	8.50	10.50	11.40
	Kansas City	7.50	9.00	11.00	11.40
Lava, " "	El Paso	2.20	2.60	3.60	5.00
	Pueblo	5.20	6.70	8.70	10.00
	Denver	6.70	8.20	10.20	11.00
	Kansas City	7.20	8.70	10.70	11.00
San Marcial, " "	El Paso	2.40	3.00	4.00	5.00
	Pueblo	5.20	6.70	8.70	10.00
	Denver	6.70	8.20	10.20	11.00
	Kansas City	7.20	8.70	10.70	11.00
Carthage, " "	El Paso	2.60	3.20	4.20	5.00
	Pueblo	5.20	6.70	8.70	10.00
	Denver	6.70	8.20	10.20	11.00
	Kansas City	7.20	8.70	10.70	11.00
San Antonio, " "	El Paso	2.40	3.00	4.00	5.00
	Pueblo	5.20	6.70	8.70	10.00
	Denver	6.70	8.20	10.20	11.00
	Kansas City	7.20	8.70	10.70	11.00
Magdalena, " "	El Paso	2.80	3.50	5.00	6.00
	Pueblo	5.80	7.50	10.00	11.00
	Denver	7.30	9.00	11.50	12.50
	Kansas City	7.80	9.50	12.00	13.00
Socorro, " "	El Paso	2.80	3.50	5.00	6.00
	Pueblo	5.80	7.50	10.00	11.00
	Denver	7.30	9.00	11.50	12.50
	Kansas City	7.80	9.50	12.00	13.00
Albuquerque, " "	El Paso	3.00	4.00	6.00	7.00
	Pueblo	6.00	8.00	10.00	11.00
	Denver	7.50	9.50	11.50	12.50
	Kansas City	8.00	10.00	12.00	13.00
Bernalillo, " "	El Paso	3.20	4.20	6.20	7.20
	Pueblo	6.20	8.20	10.20	11.20
	Denver	7.70	9.70	11.70	12.70
	Kansas City	8.20	10.20	12.20	13.20
Wallace, " "	El Paso	3.40	4.40	6.40	7.40
	Pueblo	6.40	8.40	10.40	11.40
	Denver	7.90	9.90	11.90	12.90
	Kansas City	8.40	10.40	12.40	13.40
Los Cerillos, " "	El Paso	3.60	4.60	6.60	7.60
	Pueblo	6.60	8.60	10.60	11.60
	Denver	8.10	10.10	12.10	13.10
	Kansas City	8.60	10.60	12.60	13.60
Flagstaff, A. T.	El Paso	6.80	8.00	10.00	11.00
	Pueblo	7.50	9.00	11.00	12.00
	Denver	9.00	10.50	12.50	14.00
	Kansas City	9.50	11.00	13.00	14.00
Peach Spgs, " "	El Paso	7.50	9.00	11.00	12.00
	Pueblo	8.00	9.50	11.50	12.50
	Denver	9.50	11.00	13.00	14.00
	Kansas City	10.00	11.50	13.50	14.50
Klegman, " "	El Paso	7.50	9.00	11.00	12.00
	Pueblo	8.00	9.50	11.50	12.50
	Denver	9.50	11.00	13.00	14.00
	Kansas City	10.00	11.50	13.50	14.50
Yucca, " "	El Paso	7.50	9.00	11.00	12.00
	Pueblo	8.00	9.50	11.50	12.50
	Denver	9.50	11.00	13.00	14.00
	Kansas City	10.00	11.50	13.50	14.50
Needles, Cal.	El Paso	7.50	9.00	11.00	12.00
	Pueblo	8.00	9.50	11.50	12.50
	Denver	9.50	11.00	13.00	14.00
	Kansas City	10.00	11.50	13.50	14.50
Penner, " "	El Paso	7.50	9.00	11.00	12.00
	Pueblo	8.00	9.50	11.50	12.50
	Denver	9.50	11.00	13.00	14.00
	Kansas City	10.00	11.50	13.50	14.50
Bagdad, " "	El Paso	7.50	9.00	11.00	12.00
	Pueblo	8.00	9.50	11.50	12.50
	Denver	9.50	11.00	13.00	14.00
	Kansas City	10.00	11.50	13.50	14.50
Daggett, " "	El Paso	7.50	9.00	11.00	12.00
	Pueblo	8.00	9.50	11.50	12.50
	Denver	9.50	11.00	13.00	14.00
	Kansas City	10.00	11.50	13.50	14.50
Barstow, " "	El Paso	7.50	9.00	11.00	12.00
	Pueblo	8.00	9.50	11.50	12.50
	Denver	9.50	11.00	13.00	14.00
	Kansas City	10.00	11.50	13.50	14.50
Kramer, " "	El Paso	7.50	9.00	11.00	12.00
	Pueblo	8.00	9.50	11.50	12.50
	Denver	9.50	11.00	13.00	14.00
	Kansas City	10.00	11.50	13.50	14.50
Mojave, " "	El Paso	7.50	9.00	11.00	12.00
	Pueblo	8.00	9.50	11.50	12.50
	Denver	9.50	11.00	13.00	14.00
	Kansas City	10.00	11.50	13.50	14.50

Rates on Copper or Zinc Ore to Canon City.

Taking Effect July 1st, 1891.—So far as rates on Copper or Zinc Ores are concerned, Canon City, Col., will be considered as common with Pueblo; in other words the rates shown in Tariff as applying on shipments of Ore to Pueblo, will also apply on shipments of Copper or Zinc Ore to Canon City.

In the absence of positive information as to the value of Ore, Ore Concentrations, or Base Metal, Agents will bill at rates sufficiently high to protect the Company. These rates can be corrected when evidence of actual value is produced.

The market price at destination, to be verified by assays made

by the Railroad Company, at owner's expense, will govern the value and determine the rate.

THE PUEBLO Smelting and Refining Company,

PUEBLO, COLORADO.

BUYERS OF
Gold, Silver, Lead and Copper Ores,
Copper Matte and Bullion.

Refiners of Gold, Silver, Lead and Copper.

Manufacturers of Bar and Pig Lead, Lead Pipe, Antimonial Lead, Copper Ingots,
Granulated Test Leads and Litharge.

Pays Highest Prices for all classes of Ores.

Especial Attention to Sampling by most Approved Processes.

Quick Returns on all Consignments.

Kendall Gold and Silver Extraction Co.

THE KENDALL PROCESS is the most efficient method of using cyanide for the extraction of precious metals from their ore; wherever this process has been adopted the result has been increased percentages of values recovered and saving of time; material reduction in consumption of chemical has also been demonstrated with respect to several classes of ores.

The Kendall System is covered by patents which this Company will defend.

THE AMERICAN CYANIDE GOLD & SILVER RECOVERY Co., organized in Denver, more than a year ago to introduce and operate the Kendall Process in several States, have closed contracts with some ten mines for the use of this process after exhaustive comparative tests with the ordinary plain cyanide method.

Captain De la Mar has adopted the process at his Nevada Mines, where a 250-ton plant is being completed. He writes that he is saving 95 per cent. of his gold values, and regards the Kendall Process as the cheapest and best he is aware of for the treatment of gold ores.

All ores, without exceptions, amenable to cyanide treatment, can be treated to better advantage by the Kendall Process. This can be accepted as an axiom.

Owners of mines and reduction Works can obtain full information on application to

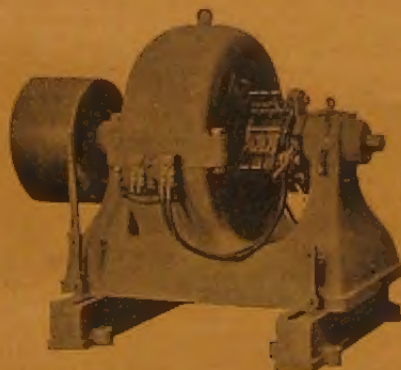
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47 Broadway, New York City

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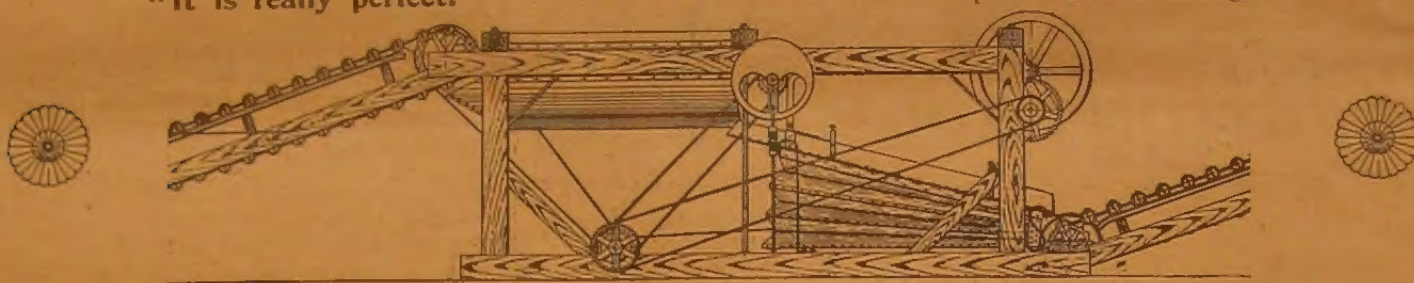
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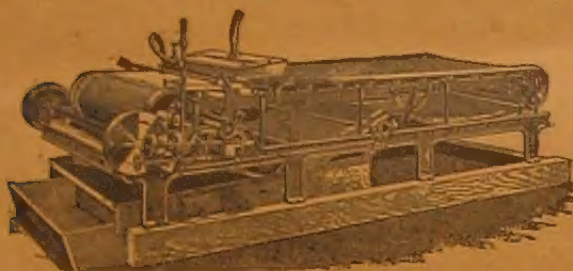
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Water Works Machinery
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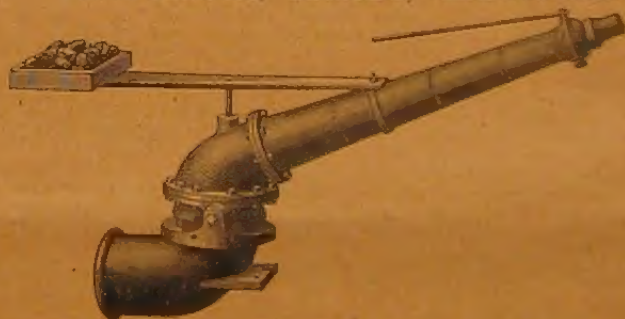
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Knowles Steam Pumps**Lidgerwood Hoisting Engines****Dodge Rock Breakers and Pulverizers****Ingersoll-Sergeant Rock Drills and Air Compressors****Wood Working, Iron Working and Saw Mill Machinery.**